



Resilient Landscapes and Livelihoods Project

Conservation Agriculture Using Mulching Technology: The Case of Rubamyo Micro Watershed, Oura Woreda

Executive summary

The use of conservation agriculture using mulching technology is able to benefit farmers by reducing crop production cost, and increasing yield quality and quantity of crops. In addition, the technology contributes for sustainable conservation of agricultural land. It also prevents traditional ways of preventing weeds and grass, such as burning residues on a farm field, which usually is a cause for wildfire. This best-practice review confirmed that mulching technology has secured high level of user's acceptance, it is proved to be effective and efficient. Furthermore, it is highly relevant for sustainable farmland management with ease of replication for scaling-up. According to the national SLM best practice documentation guideline, mulching technology meets all the requirements to be considered and documented as an SLM best practice.

Mulching practice and its challenges

Rubamyo micro watershed is part of Hoha major watershed, which is located in Benishangul Gumuze region, Oura woreda at around 1503m above sea level. The woreda is dominantly fall in

the wet-kola agro ecological zone with mean annual temperature of 26°C (Annual high temperature 31.63°C Annual low temperature 20.59°C) and mean annual rainfall ranges from 980-1200 mm. According to FAO soil classification, the dominant Soil type in that particular area is Humic Nitosols.

Before farmers treated their farm site using mulching, they said in a discussion with the farmers that there were many insect pests in the fields such as stake borer, fall armyworm, termite pests and various weeds, especially Striga weed. In addition, the agricultural field has been repeatedly plowed, so the soil fertility has been depleted. As a result, the farmers have been getting low yields. The grass that is used for mulching is burnt in wildfire and the crop residue used as firewood. Due to application of mulching, the farmers in the watershed are currently becoming to protect grass from wildfire and then collect grass from closure areas and also leave crop residue on farm site.

Action steps and solution

Conservation agriculture using mulching technology fits well to restore degraded farm and increases the production and productivity of crops in quantity and quality. Farmers recommend collecting crop residues and hay; and collecting grass from closure areas before it burns in wildfires. The activity of mulching is done

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immediately after the crop harvested from the field, before the soil moisture is exhausted. It is necessary to protect the mulched land from getting trampled by and damage with animals and people. During sowing time, it is necessary to prepare the pit without clearing the mulch.

Table 1 screening the impact of Conservation Agriculture using mulching technology in oura woreda

Technology /practice	Location	Criteria	Weight (WT)	Rate & score response		Product (WT *SC)
				%	Score (SC)	
Conservation Agriculture using mulching technology	Agusha micro watershed in the Sonka major watershed (Assosa District)	Acceptance	0.22	80	3	0.66
		Effectiveness	0.22	90	3	0.66
		Efficiency	0.14	95	3	0.42
	Relevance	0.14	95	3	0.42	
	Sustainability	0.14	75	3	0.42	
	Scalability	0.14	75	3	0.42	
Total			1		18	3

Results

In Rubamyo, micro watershed Farmers understood that conservation agriculture using mulching technology minimizes soil erosion by flood and wind and improves soil structure (figure 1).



Figure 1:- improved soil structure and fertility

They also agreed that mulching reduces the frequency of farming, cost of pesticides and labor expenditure due to the reduction of pest incidence and severity. According to the information received from the farmers' discussion, Mr. Ayub said, "I went beyond eating spike and stored the produce in the barn" it was understood that the importance of mulching technology in improving crop productivity is significant. In the case of Mr. Meela Abdulbaji, one of the farmers in the watershed was able to get 93 quintals from one

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hectare in the 2018/19 cropping season, 96 quintals from one hectare in the 2019/20 cropping season, and 83 quintals from one hectare in the 2020/21 cropping season. Also, Amuna Ayub was able to get 80 quintals from one hectare in the 2018/19 cropping season, 95 quintals from one hectare in the 2019/20 cropping season and 80 quintals from one hectare in the 2020/21 cropping season. This has improved the productivity of these individuals who were not getting more than 40 quintals from one hectare without using this technology.



Figure 2:- Hundred Maize Seed Weight

As it can be understood from the figure 2 above, according to the responses from the farmers, using the technology in the production of maize crops a farmer who separately store the produce produced by a farm with mulch and without mulch, according to the information taken from the weight of one hundred

maize kernels, the farm with mulch is 42.02 grams and the farm without mulch is 29.32 grams.

Based on efficiencies and effectiveness of the technology by observing the benefit from the model farmers, many farmers in the watershed has started applying the technology to their farm sites.

Lessons learned

The lessons that farmers have learned by applying this technology to their fields have been listed as the following:-

- The grass, which was a breeding ground for various pests, and which was burned by wildfires every year, could be used for conservation agriculture using grass mulch technology.
- The crop residue on farm land which was collected for firewood used for mulching
- After the crop is harvested from the farm land until it is covered with seeds in the second round, the land that was damaged due to exposure to various causes of soil erosion can be made sustainable by covering it with grass and protecting it from animals and humans.
- They should be able to understand that production enhancement inputs by keeping the production period lead to additional costs and that the farming method is not sustainable in terms of land management and use.



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- The application of this technology will reduce the occurrence of regularly occurring pests such as termites, stock borer and weeds, as well as the epidemic level of fall army worm, thereby reducing the need for pesticide purchases and labor costs;
- They have realized that applying this technology to their farms has resulted in a much better crop yield in terms of quantity and quality than what they were getting before without using the technology, and it has brought them a huge difference in income and impacts on improving livelihood.

Recommendations

It is known that, Conservation Agriculture using mulching technology is a technology that has been applied to farmers' fields for more than three years. Therefore, it was possible to suggest the following recommendations regarding the importance and implementation of the technology:-

Conservation Agriculture using mulching technology is a positive contribution to sustainable land management by improving soil structure and also increasing crop yield. This technology reduces the cost of growing crops by reducing the incidence and severity of crop pests and farm work, reducing labor and pesticide costs. The technology will make the farmer more profitable by minimizing production cost and maximizing crop production. Depleted of soil fertility, bare farmland and unfit for crop cultivation, as

well as such sites requiring high labor and financial costs to grow crops, will be converted into productive land and economically worthwhile alternative to farm lands without mulch technology. Also this technology is used to produce a healthy crop free from pesticides, as no or minimal pesticides are used because there are no or few pests that potentially reduce crop yields. Therefore, it is necessary to benefit farmers by expanding the technology to other farmers.

References

- 2020/21 CROPPING SEASON CSA CROP YIELD ASSESSMEN report, Benishangul-Gumuz RLLP, 2021.
- Benshangul Gumuz Region Agriculture and Natural Resource Bureau RLLP Project annual report, 2021.

Contributors

Bizuayehu Jemaneh Regional BOA Email bizuayehu@gmail.com

Cell phone +251 917178657

Workiye Misgana Regional PCU Email workiyemisgana@gmail.com

Cell phone +251 911031734

Dereje Chernet Regional PCU Email dlwestet@gmail.com

Cell phone +251 910932531

Semeneh Alemu Regional PCU Email semenehalemu@gmail.com

Cell phone +251 913961517